LEAFHOPPER TRAPPING METHODS: COMPARISON OF LIGHT TRAPS OPERATING ALL NIGHT AND AT SUNSET

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Abstract

Comparison of two incandescent light traps, one operating all night, the other only at sunset, from October 1981 to February 1982, revealed no major differences in the various cicadellid or fulgoroid species trapped. The data supports previous reports that *Orosius argentatus* (Evans) flies predominantly at sunset.

Introduction

A light trap operating all night has been used for monitoring leafhopper species in a study on tomato big bud disease and aspects of control of the vector *Orosius argentatus* (Evans) (Osmelak 1987a). A discussion on the problems for control of this phloem restricted, mycoplasma-like organism is given by Osmelak (1987b). A comparison of an incandescent light trap operating at sunset with a similar trap operating all night, was initiated because of unpublished reports that *O. argentatus* flew mainly at sunset. Information obtained from this study will be used to determine which operating times would be most appropriate to monitor *O. argentatus,* for the development of control measures of tomato big bud disease.

Material and methods

During the 1981/82 season, an incandescent light trap of the same construction as that described by Osmelak (1987a) was set up on a property approximately 3 km south-west of an all night light trap at Tatura. The trap was operated by a time clock switch, set to switch on 1 hour before sunset and to turn off 2 hours after sunset. Sunset times for the operating period (October 19, 1981 to the end of February 1982) were obtained from the Bureau of Meteorology.

A small weather station was set up at the site where dry and wet bulb temperatures, wind speed (using a hand-held anometer) and direction were recorded daily at sunset.

Trap catches were collected daily and all Auchenorrhyncha species caught were recorded. At the end of the season the data from the two traps were compared.

Results

A comparison of the total number of *O. argentatus* caught per week by the two different light traps is given in Fig. 1. Table 1 lists the total number of Auchenorrhyncha species caught by the two traps.

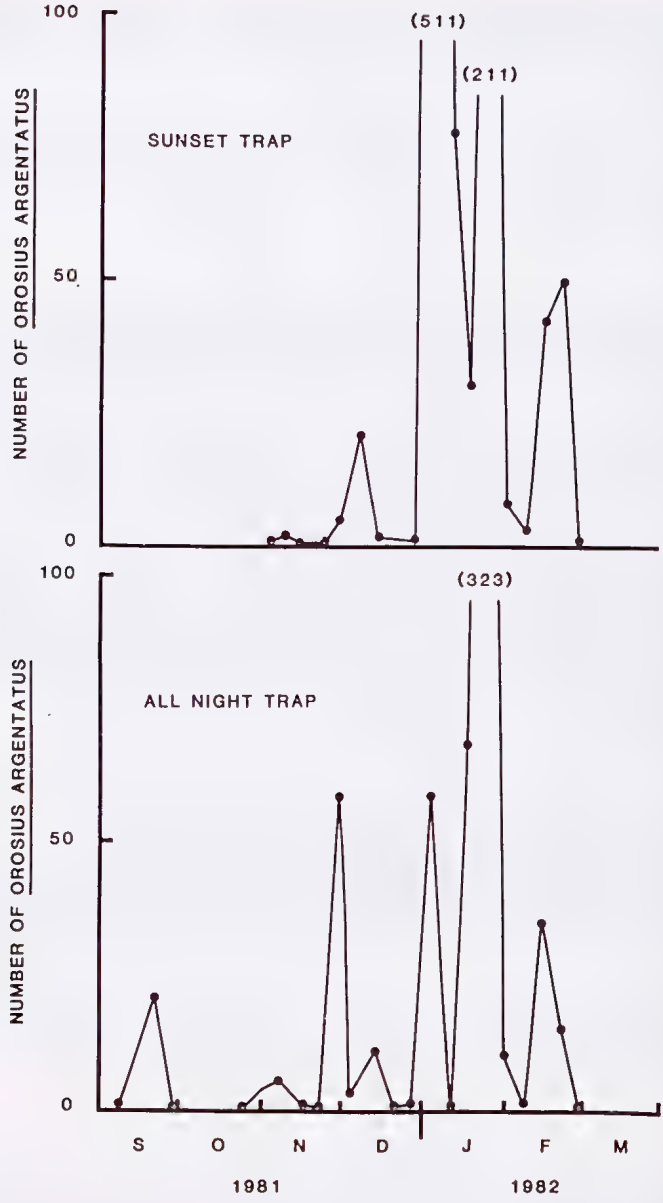

Fig. 1. Number of *Orosius argentatus* trapped in two differently timed light traps—above: 1 hr before to 2 hrs after sunset; below—all night trap.

Table 1. Total Number of Auchenorhyncha species caught from 19th Oct. 1981 to 28th Feb. 1982, in two Light Traps Operating (a) all night at Tatura and (b) at sunset 3 km away.

Description	Total Number	
	All night trap	Sunset trap
Cicadellidae		
Deltocephalinae		
Arawa sp.	2	0
Balclutha saltuella (Kirschbaum)	614	645
Balclutha incisa Matsumura	0	1
Chiasmus varicola (Kirkaldy)	1	0
Deltocephalus hospes Kirkaldy	695	994
Deltocephalus vetus Knight	4	0
Exitianus nanus (Distant)	49	46
Limotettix incerta Evans	89	237
Nesoclutha pallida (Evans)	100	141
Orosius argentatus (Evans)	611	966
Orosius canberrensis Evans	43	60
Xestocephalus tasmaniensis Evans	2	5
Typhlocybinae		
Austroasca viridigrisea (Paoli)	4439	2714
Zygina zealandica (Myers)	76	11
Agallinae		
Austroagallia torrida Evans	6	15
Jassinae		
Batracomorphus punctatus (Evans)	18	106
Xestocephalinae		
Xestocephalus tasmaniensis Evans	2	5
FULGOROIDEA		
Delphacidae		
Sardia rostrata pluto (Kirkaldy)	0	1
Sogatella kolophon (Kirkaldy)	3	3
Toya dryope (Kirkaldy)	928	1811
Toya lzaulis (Kirkaldy)	15	60
Cixiidae		
Oliarus lilinoe Kirkaldy	1	0
CERCOPOIDEA		
Machaerotidae		
Pectinariophyes stalli (Spanberg)	0	1

The weather data collected at the sunset trap site indicated that on every occasion when a large number of *O. argentatus* were caught, there was no detectable wind and the temperature was always above 20°C.

Discussion

There is a superficial similarity in the weekly catches of *O. argentatus* in the two traps (Fig. 1) but only the all night trap detected significant flight activity in September (28), November (14) and early December (60) when the respective catches in the sunset trap were 0, 5 and 4. Catches in the following 13 weeks until the end of February were adequate for comparison ($\geq$ 10 in one trap) in 9 weeks and too low ($<$ 4 in each trap) in 4 weeks. Trap catches were more or less equal ratio ($<$ 2) in 3 weeks, higher in the sunset trap in 4 weeks and in the all night trap in 2 weeks. This variability is likely to be due to differences in the local populations and microclimatic conditions at the two sites.

The various cicadellid and fulgoroid species trapped were similar for both traps, except for a few singleton species (Table 1). The variation in numbers for a particular species, is probably due to differences in the local conditions near the two traps. These results indicate that flights of *O. argentatus* and some other cicadellid and delphacid species were crepuscular. This supports the findings of Reddy and Mishra (1983) and Perfect and Cook (1982). Saxena and Justo (1982) also reported twilight take-off and migration flights for the rice brown planthopper *Nilaparvata lugens* (Stäl).

Even though traps gave similar results, it was decided to continue with the all night trap, to ensure continuity of results over the seasons and to gather as much information as possible on leafhopper occurrences. Helson (1942) reports flights of *O. argentatus* as late as 2200 hours on very warm nights. The sunset trap would not have detected these flights. Information on other leafhoppers during these conditions would also be of value.

Acknowledgements

The author wishes to thank Mr D. Runciman for recording daily catches and weather data, Mr K. Runciman on whose property the trial was conducted; Mr O. Dunne, Irrigation and Salinity Research Institute Tatura, for collections and Mr D. Clode for technical assistance. Special thanks to Dr M.J. Fletcher, Biological and Chemical Research Institute, Rydalmere for his co-operation, discussions and identification. The work was funded by the Processing Tomato Research Fund and the Victorian Department of Agriculture and Rural Affairs.

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